

IN THE CLAIMS:

Please amend the claims as shown in the following claim listing.

CLAIM LISTING:

1-79. (Cancelled).

80. (New) A method of forming an all thermoplastic, perfluorinated resin hollow fiber module consisting of the following steps:

(a) contacting a plurality of hollow fiber membranes made from one or more thermoplastic, perfluorinated resins with one or more molten thermoplastic, perfluorinated potting resins, wherein the potting resins have a peak melting point lower than that of the hollow fiber membranes, and a melt viscosity lower than that of the hollow fiber membranes, thereby forming a substantially parallel array of membranes;

(b) conducting a first heating step, wherein the one or more potting resins are heated to a temperature above their peak melting point, but at or below the peak melting point of the hollow fiber membranes, such that they are applied to the array of membranes at a contact temperature which causes the one or more potting resins streams to flow around the array of membranes, thereby forming a bundle of hollow fiber membranes;

(c) cooling the bundle; and then

(d) conducting a second heating step wherein the bundle is heated to a temperature below the peak melting point of the hollow fibers and at or above the peak melting point of the one or more potting resins, for a period of time ranging from about 1 to about 24 hours, thereby eliminating any voids in the potting resins and forming a fluid-tight seal between the potting resins and the hollow fiber membranes;

whereby complete encapsulation and sealing of the fibers by the potting resin takes place without damage to the fibers or collapse of the hollow fiber membrane lumen.

81. (New) The method of Claim 80, wherein the peak melting point of the one or more potting resins is at least 5°C below that of the hollow fiber membranes.

82. (New) The method of Claim 80, wherein the peak melting point of the one or more potting resins is at least 10°C below the peak melting point of the hollow fiber membranes.

83. (New) The method of Claim 80, wherein the peak melting point of the one or more potting resins is at least 25°C below the peak melting point of the hollow fiber membranes.

84. (New) The method of Claim 80, wherein the melt viscosity of the one or more potting resins, as measured by melt flow index, is greater than 100 g/10 min. as defined by ASTM D2116 at 372°C and 5 kg load.

85. (New) The method of Claim 80, wherein the melt viscosity of the one or more potting resins, as measured by melt flow index, is greater than 150 g/10 min. as defined by ASTM D2116 at 372°C and 5 kg load.

86. (New) The method of Claim 80, wherein the melt viscosity of the one or more potting resins, as measured by melt flow index, is greater than 200 g/10 min. as defined by ASTM D2116 at 372°C and 5 kg load.

87. (New) The method of Claim 80, wherein the second heating step

ranges from about 3 to about 12 hours.

88. (New) The method of Claim 80, wherein the second heating step ranges from about 5 to about 8 hours.

89. (New) The method of Claim 80, wherein the one or more thermoplastic, perfluorinated resins of the hollow fiber membranes and the potting resins are selected from the group consisting of homopolymers, copolymers, blends of one or more homopolymers, blends of one or more copolymers and blends of one or more homopolymers and copolymers of perfluorinated resins.

90. (New) The method of Claim 80, wherein the one or more thermoplastic, perfluorinated resins of the hollow fiber membranes and the potting resins are selected from the group consisting of poly(TFE-co-PFAVE) resins and blends thereof.

91. (New) The method of Claim 80, wherein the plurality of hollow fiber membranes is formed prior to contacting the membranes with the potting resins by forming the membranes together in a contiguous relation.

92. (New) The method of Claim 80, wherein the array is formed prior to contacting the membranes with the potting resins by forming the membranes together in a spaced apart relation.

93. (New) The method of Claim 80, wherein the potting resin is a thin stream deposited in a defined zone near one end of the membrane array.

94. (New) The method of Claim 80, further including the step of contacting a

second thin stream of potting resin near an opposite end of the array of membranes.

95. (New) The method of Claim 80, further including the step of forming a substantially parallel array of the membranes and subsequently spirally winding the array about an axis which is substantially parallel to a longitudinal axis of the membrane array while simultaneous applying the potting resin to the array of membranes to form circular bundle of fibers having at least one potted end.

96. (New) The method of Claim 80, further including the step of continuing to apply the potting resin after the circular bundle is formed to create a tubesheet of predetermined diameter about at least one end of the hollow fiber membranes.

97. (New) The method of Claim 80, further including the steps of cutting the at least one potted end of the bundle orthogonally to the longitudinal axis of the hollow fiber membranes to form the bundle with at least one flat end surface having exposed lumens and mounting the bundle into a cartridge housing.

98. (New) The method of Claim 97, wherein the bundle is mounted in the housing by fusion bonding.

99. (New) A method of making a hollow fiber membrane cartridge consisting of the steps:

a. forming a plurality of hollow fiber membranes formed of one or more thermoplastic perfluorinated resins into a substantially parallel arrangement wherein the fibers are arranged in parallel arrangement along a length of the fibers; then

b. winding the plurality of hollow fibers about an axis which is substantially parallel to the length of the hollow fiber membranes so as to form a bundle having two bundle ends;

c. simultaneously with step (b), extruding a molten stream of a

perfluorinated thermoplastic resin having a peak melting point at least 5°C below the peak melting point of the hollow fiber membranes and having a melt flow index of 100g/10 min. or greater and directing the resin onto at least one of the two bundle ends to thereby pot one or more ends in the resin;

- d. cooling the bundle;
- e. heating the bundle at the one or more potted ends to a temperature at or above the peak melting point of the resin of the stream but below the peak melting point of the hollow fibers for a period of time ranging from about 1 to about 24 hours, thereby eliminating any voids in the potted ends; and
- f. exposing the lumen ends of the hollow fiber membranes at one or more potted bundle ends to communicate with the exterior of the bundle;

whereby complete encapsulation and sealing of the fibers by the potting resin takes place without damage to the fibers or collapse of the hollow fiber membrane lumen.

100. (New) The method of Claim 99, further including the steps of:

- g. inserting the bundle into a housing for the bundle having a first and second end and a cylindrical housing interior being suitably shaped to contain the membrane bundle, a first means for sealing the first end of the bundle to the interior of the housing adjacent its first end, a second means for sealing the second end of the bundle to the interior of the housing adjacent its second end, the housing having one or more means for dividing the bundle into at least two regions including a shell side space exterior to the portion of the bundle between the potted ends and a space including the lumens; then
- h. applying a first end cap adjacent the first end of the housing to seal the first housing end; then
- i. applying a second end cap adjacent the second housing end so as to seal the second housing end; and

j. providing a shell side access in the housing and at least one access in at least one of the first or second end caps.

101. (New) The method of Claim 99, wherein both ends of the bundle are potted with the molten stream of the perfluorinated thermoplastic resin.

102. (New) The method of Claim 99, wherein both ends of the bundle are potted with the molten stream of the perfluorinated thermoplastic resin and wherein both ends of the bundle are exposed so that the lumen ends of the hollow fiber membranes can communicate with the exterior of the bundle.

103. (New) A hollow fiber membrane cartridge including a bundle of potted hollow fiber membranes, made by the method of Claim 80.

104. (New) A hollow fiber membrane cartridge including a bundle of potted hollow fiber membranes, made by the method of Claim 99.

105. (New) A hollow fiber membrane cartridge including a bundle of potted hollow fiber membranes made by the method of Claim 100.

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